Florida Department of Transportation

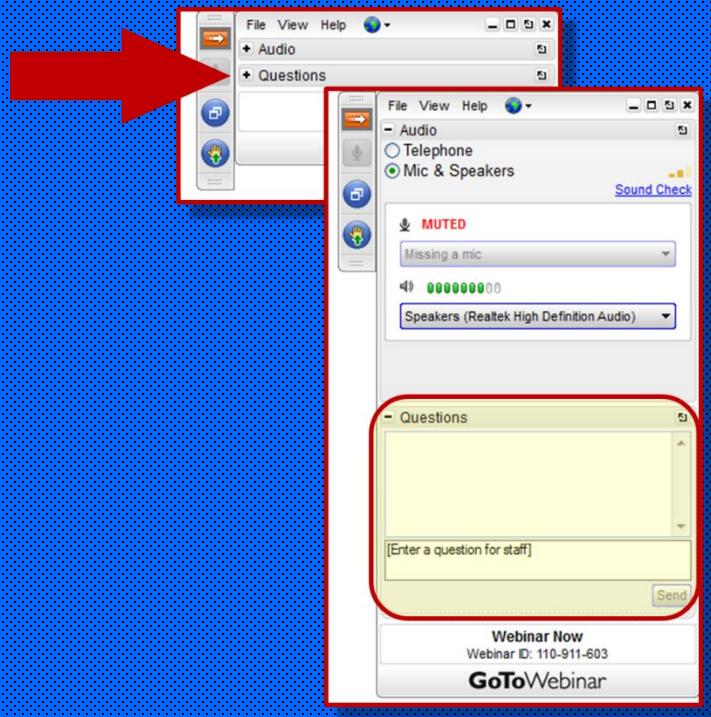
State Safety Office

Crash Data Academy

Vulnerable Road Users Part 1

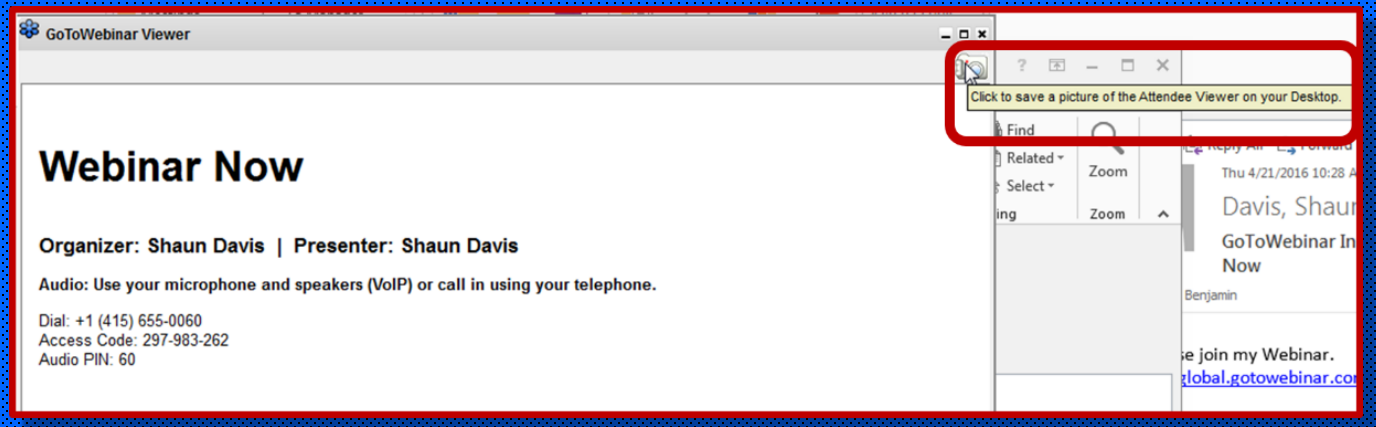
How to ask a question:

- Control panel on right side of screen
- Use question pane
  - Type questions and comments
  - Click send



How to capture the webinar window:

- Webinar viewer
  - Top, right corner
- Camera icon



Florida Department of Transportation
State Safety Office

CRASH DATA ACADEMY: VULNERABLE ROAD USERS – PART I

Presented By:
Trenda McPherson
State Bicycle/Pedestrian Safety Program Manager

Introductions

Presentation by:

Mrs. Trenda McPherson
Florida Department of Transportation
State Bicycle Pedestrian Safety Program Manager
www.alerttodayflorida.com

Vulnerable Road Users

Who is considered a vulnerable road user?

Florida Statute 316.027(1)(b) "Vulnerable road user" means:

1. A pedestrian, including a person actually engaged in work upon a highway, or in work upon utility facilities along a highway, or engaged in the provision of emergency services within the right-of-way;

2. A person operating a bicycle, motorcycle, scooter, or moped lawfully on the roadway;

3. A person riding an animal; or

4. A person lawfully operating on a public right-of-way, crosswalk, or shoulder of the roadway:

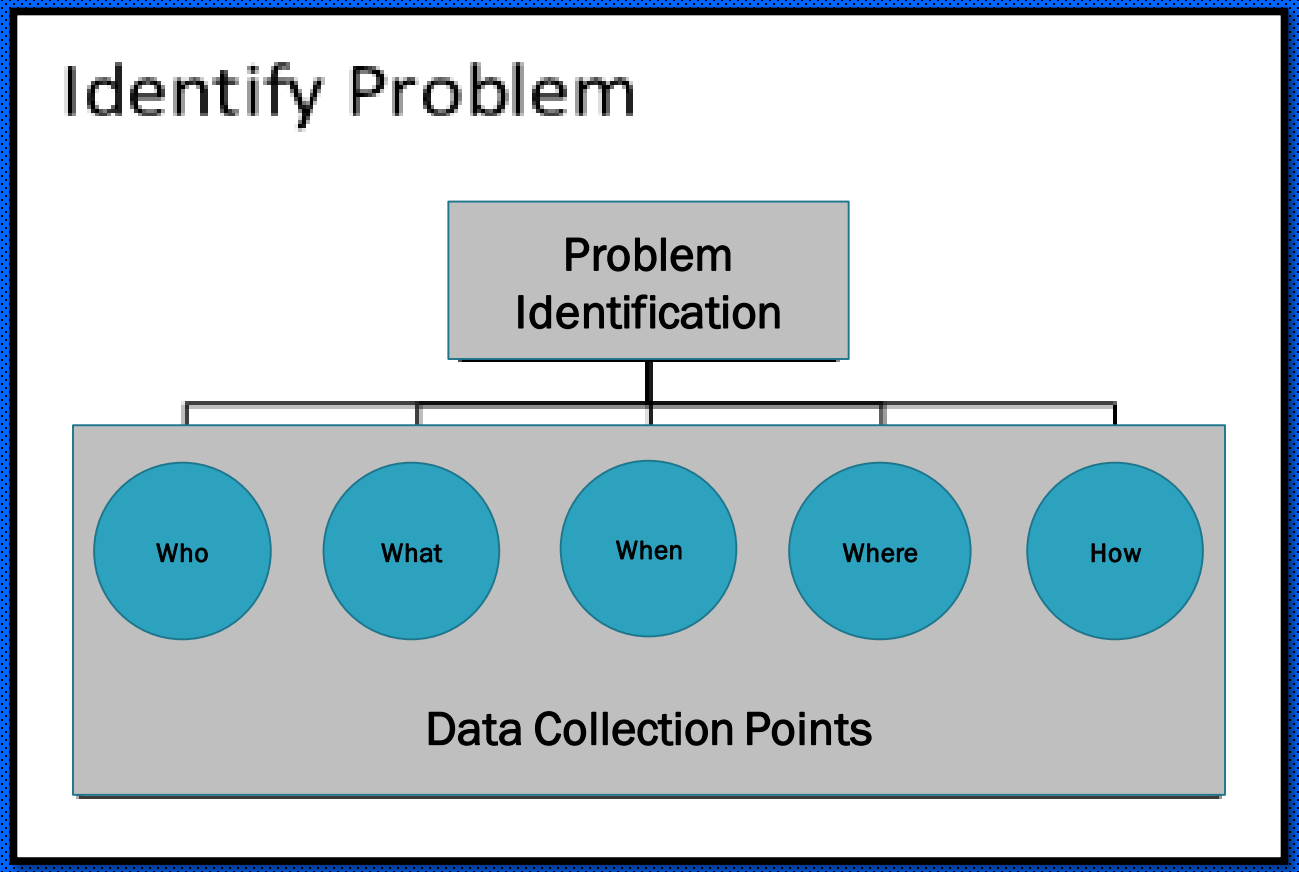
    a. A farm tractor or similar vehicle designed primarily for farm use;
    b. A skateboard, roller skates, or in-line skates;
    c. A horse-drawn carriage;
    d. An electric personal assistive mobility device; or
    e. A wheelchair.

Road Map

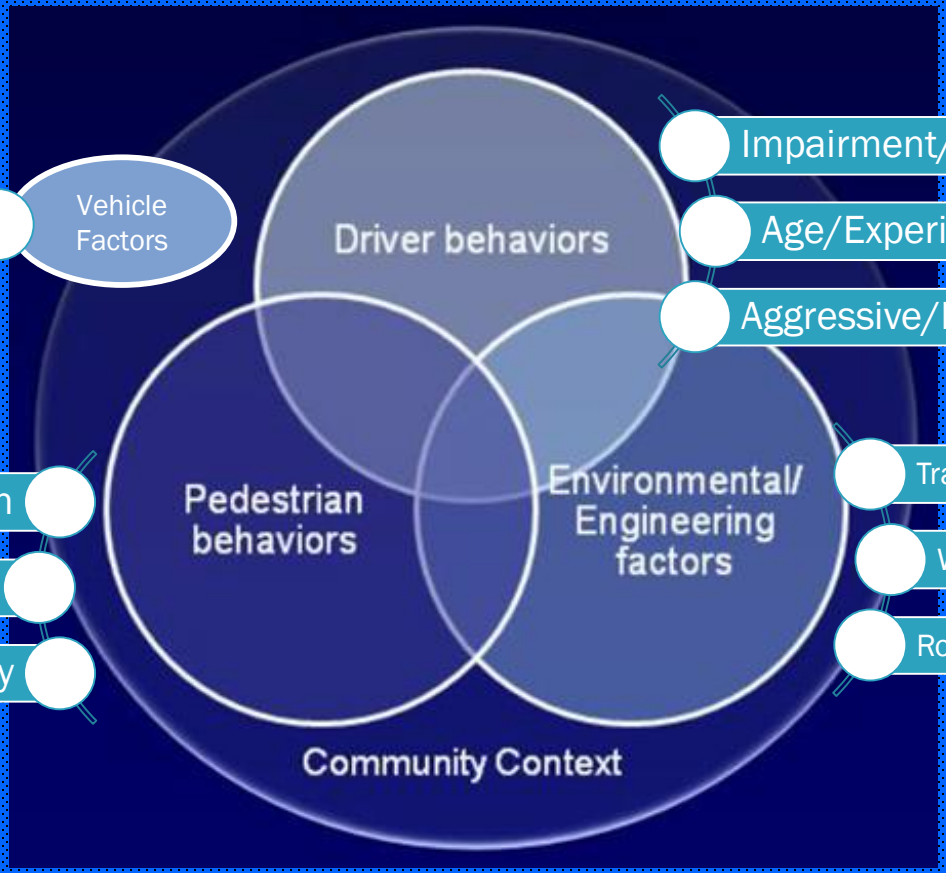
- Problem Identification Process
- Qualities of Good Data
- Data Types
  - Florida Crash Report Information
- Data Sources
- Data Challenges
- Data Analysis

Problem Identification Process

Problem Identification is the process of analyzing crash data and other pertinent information to isolate specific facts about traffic crashes that can be used to select the appropriate countermeasures and crash reduction strategies.



Problem Identification Tool



Vehicle Factors

- Equipment Failure

Driver behaviors

- Impairment/Speed
- Age/Experience
- Aggressive/Distracted

Pedestrian behaviors

- Dart/Dash
- Crossing Location
- Visibility

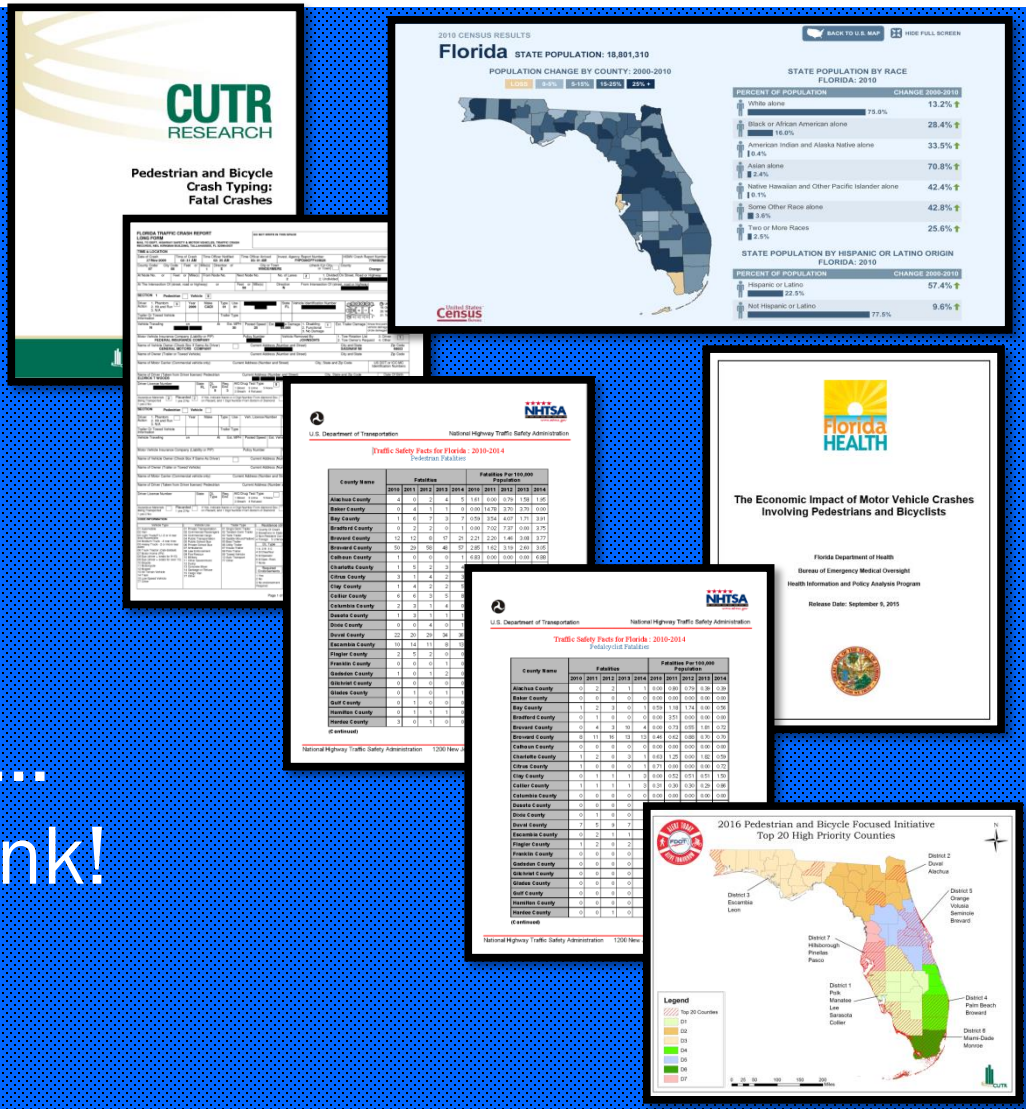
Environmental/ Engineering factors

- Travel Speeds/Lane Widths
- Weather/Lighting Conditions
- Roadway Geometry/Site Distance

Qualities of Good Data

From Baselines to Outcomes: Quality Data is the KEY to Success

Data Collection



It's not always in the ink...
Sometimes it's in the think!

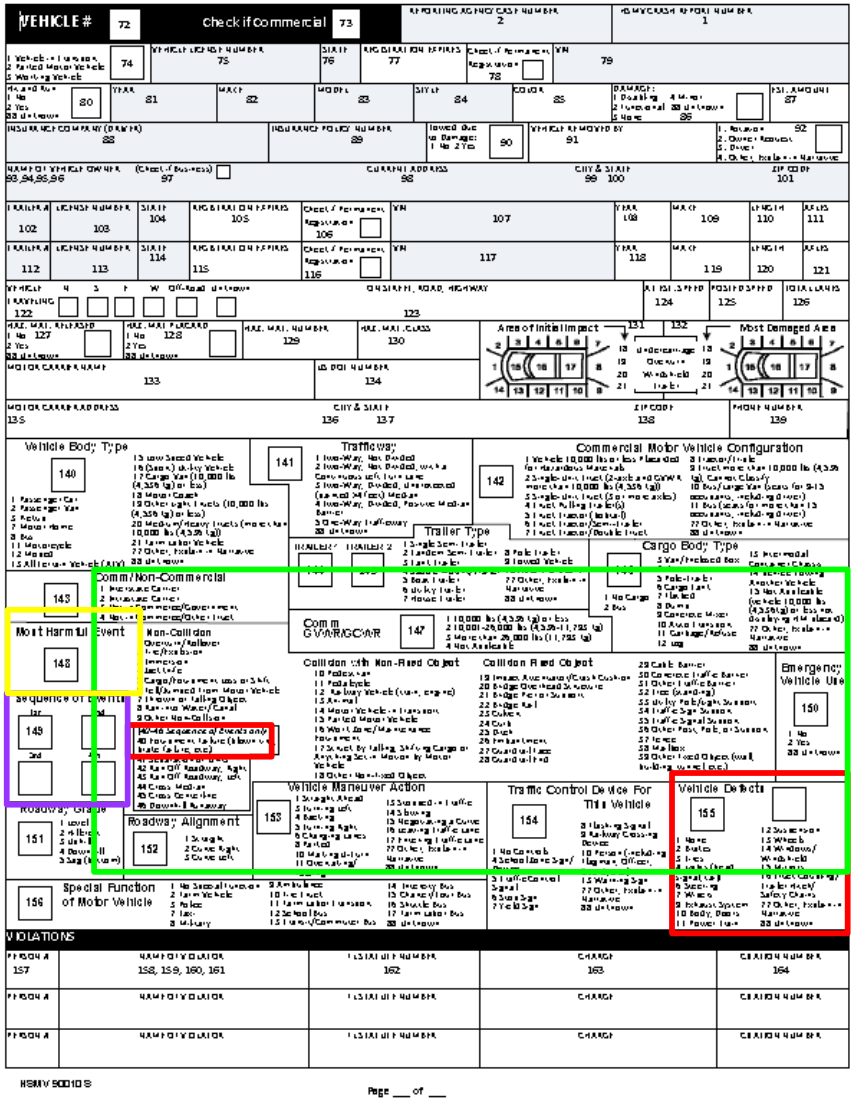
Data Types

Roadway or Environmental

What roadway
other "no
to the cras

What data se
information?

Data Types



What about vehicle data? Where do you find information about a possible equipment failure?

With so much data to capture, how do you determine the crash type and contributing factors?

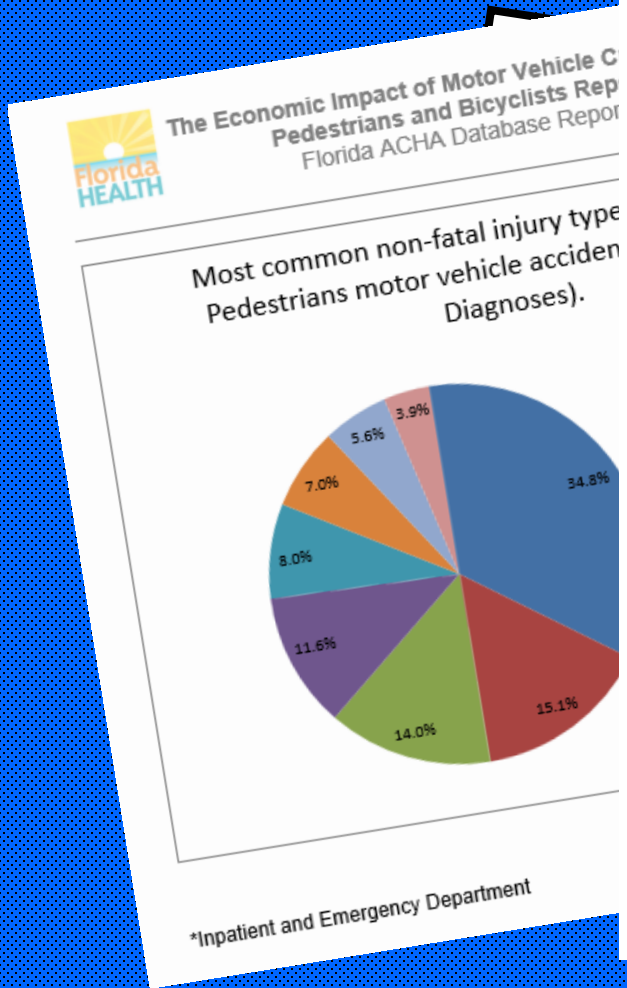
The sequence of events?

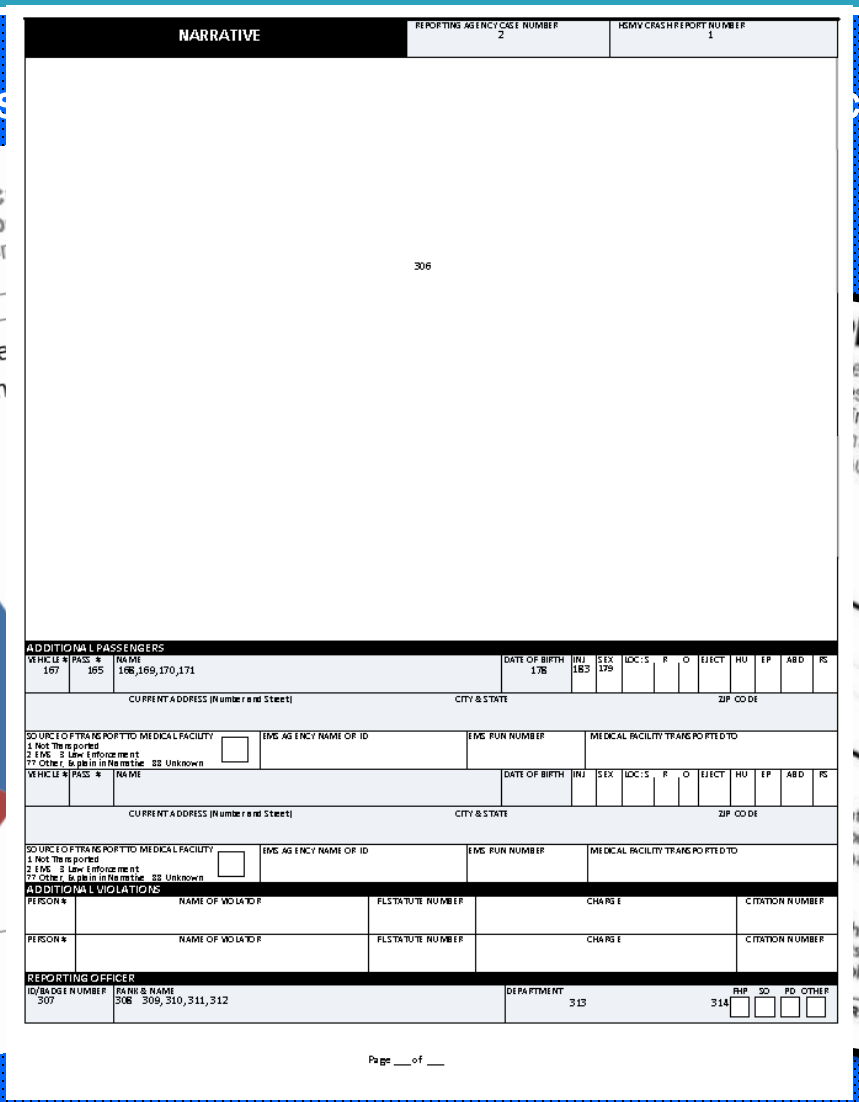
The most harmful event resulting from the crash?

Data Types

Crash Specific Data:

What other data to "tells the s crash?

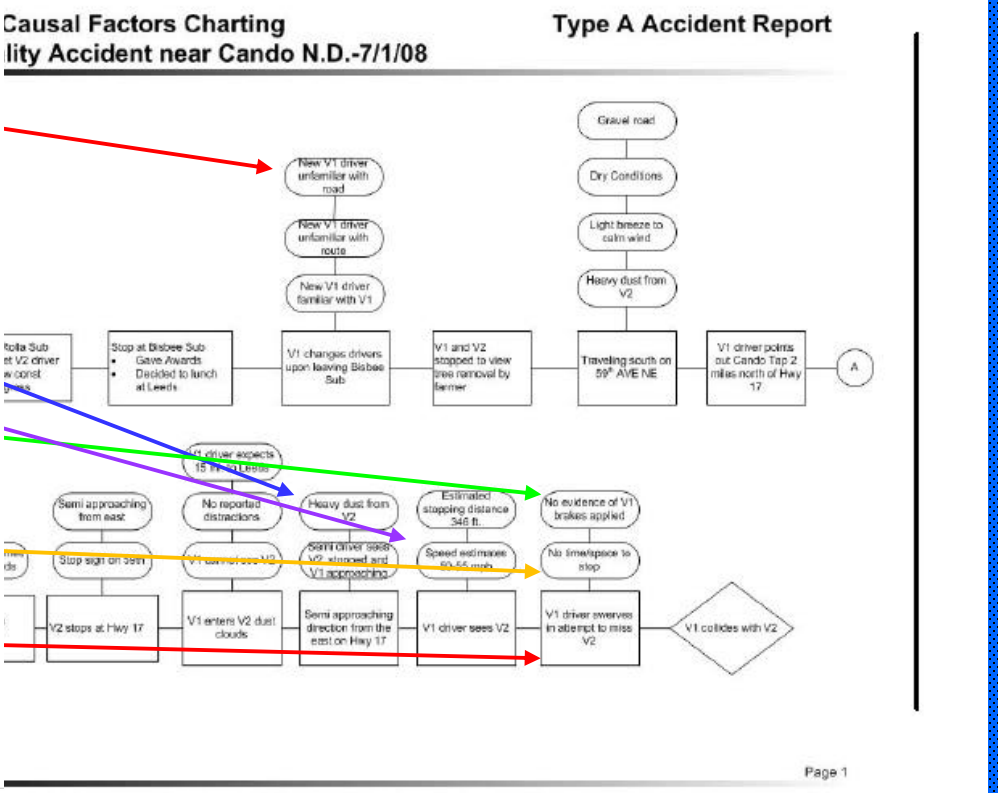




Data Types

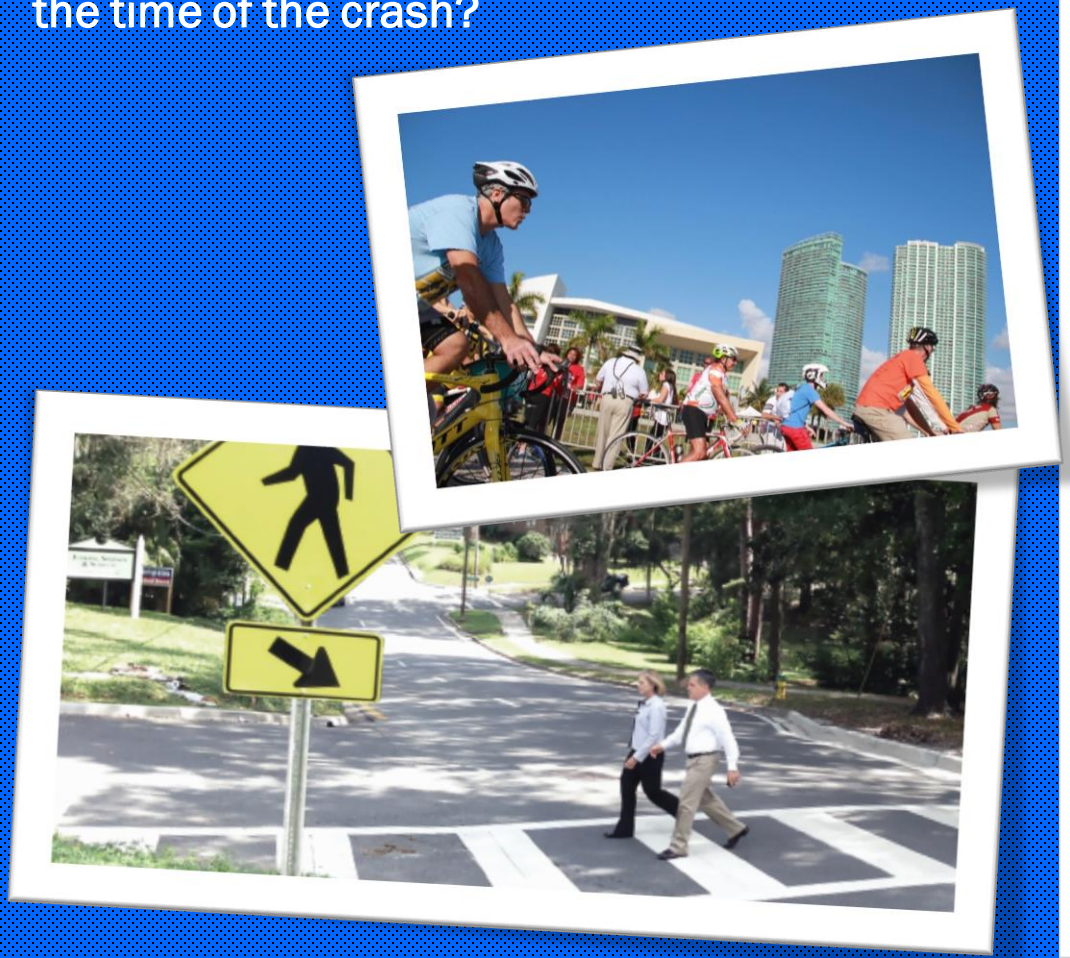
behavior or other human factors that

Crash Investigation Report Example



Data Types

Where do you find information about what the pedestrian or bicyclist might have been doing at the time of the crash?



PERSON # 165 | REPORTING AGENCY CASE NUMBER 2 | HSMV CRASH REPORT NUMBER 1

1 Driver 2 Non-Motorist 3 Passenger 166 | VEHICLE # 167 | NAME 168, 169, 170, 171 | PHONE NUMBER 172 | Check # 173 Recommend Driver Re-exam

CURRENT ADDRESS (Number and Street) 174 | CITY & STATE 175 176 | ZIP CODE 177

DATE OF BIRTH 178 | SEX: 179 1 Male 2 Female 3 Unknown | DRIVER LICENSE NUMBER 180 | STATE 181 | EXPIRES 182 | INJURY SEVERITY (INJ) 183 1 None 2 Possible 3 Non-Incapacitating 4 Incapacitating 5 Fatal (within 30 days) 6 Non-Traffic Fatality

DRIVER

DL Type 184: 1 A 2 B 3 C 4 D/Chauffeur 5 E/Operator 6 E/Oper – Rest 7 None

Required Endorsements 185: 1 Yes 2 No 3 No Req. Endorsement

Drivers Actions at Time of Crash 186 (1st, 2nd, 3rd, 4th): 1 No Contributing Action 2 Operated MV in Careless or Negligent Manner 3 Failed to Yield Right-of-Way 4 Improper Backing 5 Improper Turn 10 Followed Too Closely 11 Ran Red Light 12 Drove Too Fast for Conditions 13 Ran Stop Sign 15 Improper Passing 17 Exceeded Posted Speed 21 Wrong Side of Wrong Way 23 Failed to Keep in Proper Lane 26 Ran off Roadway 27 Disregarded other Traffic Sign 28 Disregarded other Road Markings 29 Over-Correcting/Over-Steering 30 Swerved or Avoided : Due to Wind, Slippery Surface, MV, Object, Non-Motorist in Roadway, etc. 31 Operated MV in Erratic, Reckless or Aggressive Manner 77 Other Contributing Action

Condition At Time of Crash 187: 1 Apparently Normal 2 Asleep or Fatigued 3 Ill (sick) or Ailment 4 Seizure, Epilepsy, Blackout 5 Physically Impaired 6 Emotional (depression, anger, disturbed, etc.) 9 Under the Influence of Medications /Drugs/Alcohol 77 Other, Explain in Narrative 88 Unknown

Driver Distracted By 188: 1 Not Distracted 2 Electronic Communication Devices (cell phone, etc.) 3 Other Electronic Device (navigation device, DVD player) 4 Other Inside the Vehicle (explain in narrative) 5 External Distraction (outside the vehicle, explain in narrative) 6 Texting 7 Inattentive 88 Unknown

Driver Vision Obstructions 189: 1 Vision Not Obscured 2 Inclement Weather 3 Parked/Stopped Vehicle 4 Trees/Crops/Bushes 5 Load on Vehicle 6 Building/Fixed Object 7 Signs/Billboards 8 Pig 9 Smoke 10 Glare 77 All Other, Explain in Narrative

DRIVER OR PASSENGER

Motor Vehicle Seating Position: LOCATION: SEAT ROW OTHER (LOC)

Seat 190: 1 Left 2 Middle 3 Right 77 Other (explain in narrative) 88 Unknown

Row 191: 1 Front 2 Second 3 Third 4 Fourth 77 Other Row 88 Unknown

Other 192: 1 Not Applicable 2 Sleeper Section of Truck Cab 3 Other Enclosed Cargo Area 4 Unenclosed Cargo Area 5 Trailing Unit 6 Riding on Motor Vehicle Exterior (non-trailing unit)

Helmet Use (HU) 193: 1 DOT-Compliant Motorcycle Helmet 2 Other Helmet 3 No Helmet

Eye Protection (EP) 194: 1 Yes 2 No 3 Not Applicable

Restraint Systems (RS) 195: 1 Not Applicable (non-motorist) 2 None Used - Motor Vehicle Occupant 3 Shoulder and Lap Belt Used 4 Shoulder Belt Only Used 5 Lap Belt Only Used 6 Restraint Used - Type Unknown 7 Child Restraint System - Forward Facing 8 Child Restraint System - Rear Facing 9 Booster Seat 10 Child Restraint Type Unknown

Air Bag Deployed (ABD) 197: 1 Not Applicable 2 Not Deployed 3 Deployed-Front 4 Deployed-Side 5 Deployed-Other (knee, air belt, etc.) 6 Deployed-Combination 7 Deployed-Curtain 88 Deployment Unknown

Ejection (EJECT) 196: 1 Not Ejected 2 Ejected, Totally 3 Ejected, Partially 4 Not Applicable

NON-MOTORIST

Non-Motorist Description 198: 1 Pedestrian 2 Other Pedestrian (wheelchair, person in building, skater, pedestrian conveyance, etc.) 3 Bicyclist 4 Other Cyclist 5 Occupant of Motor Vehicle Not in Transport (parked, etc.) 6 Occupant of a Non-Motor Vehicle Transportation Device 7 Unknown Type of Non-Motorist

Non-Motorist Location At Time of Crash 199: 1 Intersection - Marked Crosswalk 2 Intersection - Unmarked Crosswalk 3 Intersection - Other 4 Midblock - Marked Crosswalk 5 Travel Lane - Other Location 6 Bicycle Lane 7 Shoulder/Roadside 8 Sidewalk 9 Median/Crossing Island 10 Driveway Access 11 Shared-Use Path or Trail 12 Non-Trafficway Area 77 Other, Explain in Narrative 88 Unknown

Action Prior to Crash 200: 1 Crossing Roadway 2 Walking to Cross Roadway 3 Walking/Cycling Along Roadway with Traffic (in or adjacent to travel lane) 4 Walking/Cycling Along Roadway Against Traffic (in or adjacent to travel lane) 5 Walking/Cycling on Sidewalk 6 In Roadway – Other (working, playing, etc.) 7 Approaching Roadway (e.g., shoulder, median) 8 Going to or From School (0-12) 9 Working in Trafficway (incident response) 10 None 77 Other, Explain in Narrative 88 Unknown

Safety Equipment 201: 1 None 2 Helmet 3 Protective Pads Used (elbows, knees, shins, etc.) 4 Reflective Clothing (jacket, backpack, etc.) 5 Lighting 6 Not Applicable 77 Other, Explain in Narrative 88 Unknown

Non-Motorist Actions/Circumstances 202: 1 No Improper Action 2 Dart/Dash 3 Failure to Yield Right-of-Way 4 Failure to Obey Traffic Signs, Signals, or Officer 5 In Roadway Improperly (standing, lying, working, playing) 6 Disabled Vehicle Related (working on, pushing, leaving/approaching) 7 Entering/Exiting Parked/Standing Vehicle 8 Inattentive (talking, eating, etc.) 9 Not Visible (dark clothing, no lighting, etc.) 10 Improper Turn/Merge 11 Improper Passing 12 Wrong-Way Riding or Walking 77 Other, Explain in Narrative 88 Unknown

ALCOHOL/DRUG/EMS

SUSPECTED ALCOHOL USE 203: 1 No 2 Yes 88 Unknown

ALCOHOL TESTED 204: 1 Test Not Given 2 Test Refused 3 Test Given 88 Unknown, if Tested

ALCOHOL TEST TYPE 205: 1 Blood 2 Breath 3 Urine 77 Other, Explain in Narrative

ALCOHOL TEST RESULT 206: 1 Pending 2 Completed 88 Unknown

BAC 207

SUSPECTED DRUG USE 208: 1 No 2 Yes 88 Unknown

DRUG TESTED 209: 1 Test Not Given 2 Test Refused 3 Test Given 88 Unknown, if Tested

DRUG TEST TYPE 300: 1 Blood 2 Urine 77 Other, Explain in Narrative

DRUG TEST RESULT 301: 1 Positive 2 Negative 3 Pending 88 Unknown

SOURCE OF TRANSPORT TO MEDICAL FACILITY 302: 1 Not Transported 2 EMS 3 Law Enforcement 77 Other, Explain in Narrative 88 Unknown

EMS AGENCY NAME OF ID 303

EMS RUN NUMBER 304

MEDICAL FACILITY TRANSPORTED TO 305

ADDITIONAL PASSENGERS

VEHICLE # 167	PASS # 165	NAME 168, 169, 170, 171	DATE OF BIRTH 178	INJ 183	SEX 179	EDC: S 190	F 191	O 192	EJECT 196	HU 193	EP 194	ABD 197	PS 195
		CURRENT ADDRESS (Number and Street) 174	CITY & STATE 175 176							ZIP CODE 177			
SOURCE OF TRANSPORT TO MEDICAL FACILITY 302		EMS AGENCY NAME OF ID 303	EMS RUN NUMBER 304			MEDICAL FACILITY TRANSPORTED TO 305							
VEHICLE #	PASS #	NAME	DATE OF BIRTH	INJ	SEX	EDC: S	F	O	EJECT	HU	EP	ABD	PS
		CURRENT ADDRESS (Number and Street)	CITY & STATE							ZIP CODE			
SOURCE OF TRANSPORT TO MEDICAL FACILITY		EMS AGENCY NAME OF ID	EMS RUN NUMBER			MEDICAL FACILITY TRANSPORTED TO							

HSMV 90010 S

Page ___ of ___

Data Types

Where do you find information about pedestrian and bicyclist "incidents" where there were no motor vehicles involved?

Local enforcement agencies compile and collect incident reports in house.

Clearwater Memorial Causeway Fatal/Severe Injury Bicycle & Pedestrian Crashes (2005-2013*)

Crash date	DHSMV Report #	CPD Incident Report #	Crash description & severity
1/15/2013	n/a	CW13-7088	Single vehicle bicycle - ran off sidewalk (severe injury)
1/15/2013	n/a	CW13-7091	Bicycle wobbling, struck pedestrian (severe injury)
7/28/2012	n/a	CW12-102288	Single vehicle bicycle - fell off bicycle (fatal)
5/1/2012	n/a	CW12-56886	Single vehicle bicycle - fell off bicycle (fatal)
7/4/2010	n/a	CW10-76632	Two people on one bicycle struck a pedestrian (fatal)
8/25/2005	71601755	CW05-21806	Single vehicle bicycle - ran off sidewalk (fatal)

Emergency Room and Trauma Center data will also reflect injuries that may not have been traffic crash related.

Data Types

Is information available about the economic impact of pedestrian and bicyclist injuries, injury types, and behavioral risk factors?

http://www.floridahealth.gov/statistics-and-data/index.html

http://www.floridahealth.gov/statistics-and-data/ems-data-systems/index.html

http://www.floridahealth.gov/certificates/trauma-registry/index.html

http://www.floridahealth.gov/certificates/trauma-registry/index.html

http://www.floridahealth.gov/certificates/trauma-registry/_documents/2016-ngtr-dd.pdf

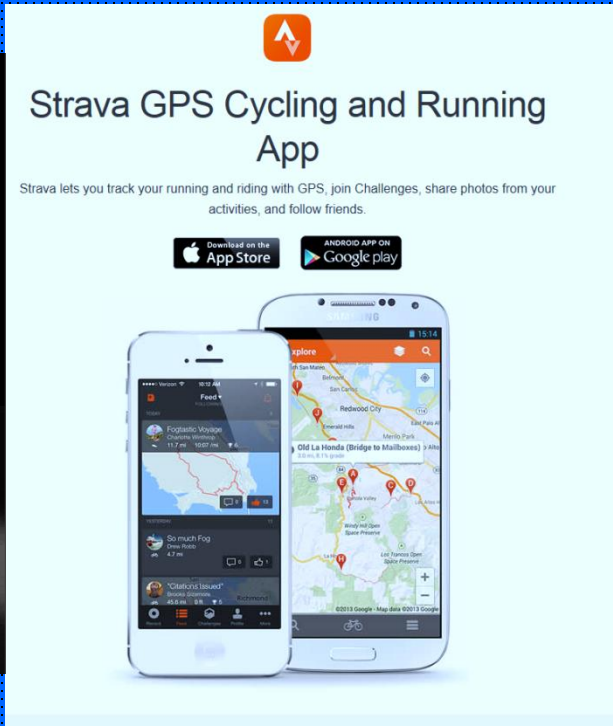
Data Types

STRAVA

An innovative strategy to collecting pedestrian and bicyclist specific data.

https://www.strava.com

Strava works with nearly every smartphone, GPS device and paired sensor, such as heart rate monitors and power meters. But only Premium unlocks the power of all that data for deep post-activity analysis, including exclusive features like Suffer Score and Race Analysis.



Data Types

10:02 AM on Saturday, September 10, 2016

Morning Ride

12.5 mi	1:08:13	0 ft
Distance	Moving Time	Elevation

68 W	279 kJ
Estimated Avg Power	Energy Output

STRAVA LABS
View Flybys ›

	Avg	Max
Speed	11.0mi/h	13.9mi/h
Calories	311	
Elapsed Time	1:48:46	

Show Less

Device: Strava Android App Bike: —

TOP RESULTS

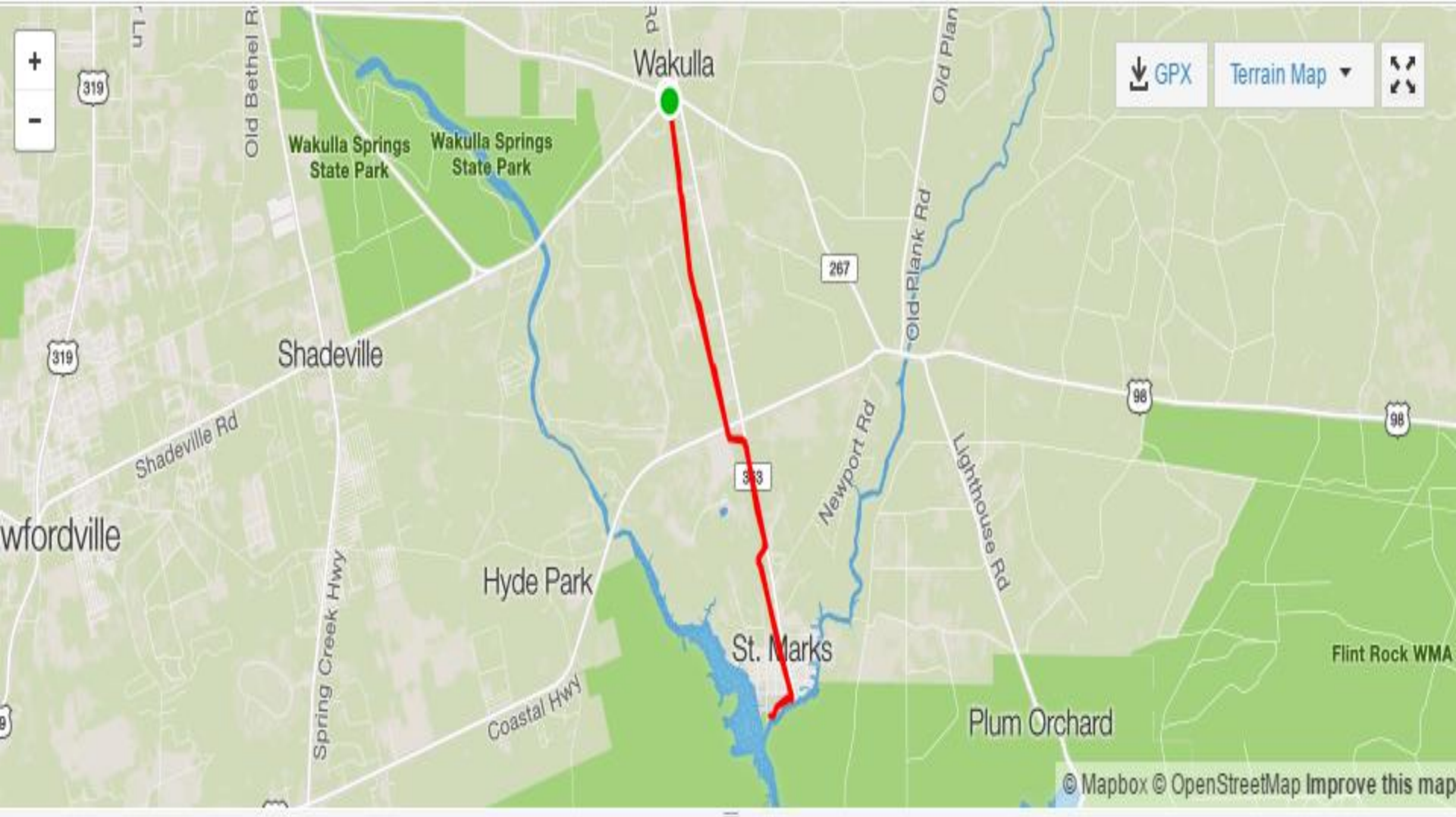
2nd fastest time on Tallahassee-St. Marks Trail: Coastal highway to St. Marks (13:20)

Segments

Learn more about segments

	Name	Time	Speed	Power	VAM	HR
★	Tallahassee-St. Marks Trail: Bloxham Cutoff Rd - Coastal Hwy 2.8mi 6ft 0%	14:36	11.5mi/h	73W		—
★ 2	Tallahassee-St. Marks Trail: Coastal highway to St. Marks 2.6mi 0ft 0%	13:20	11.8mi/h	77W		—

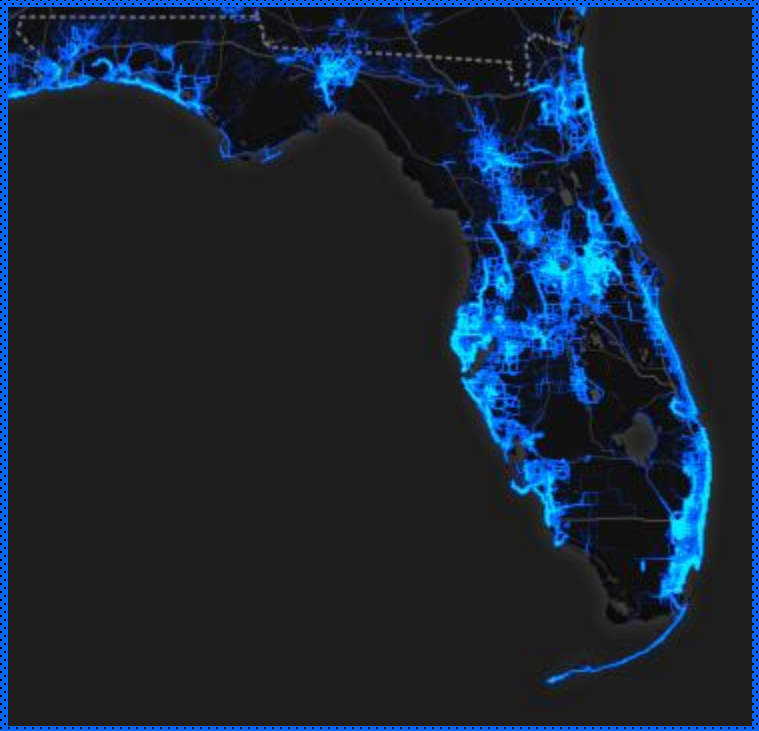
Data Types


GPX
Terrain Map
Wakulla
Wakulla Springs State Park
Wakulla Springs State Park
Old Bethel R
319
319
Shadeville
Shadeville Rd
wfordville
Spring Creek Hwy
Hyde Park
Coastal Hwy
St. Marks
267
Old Plank Rd
Old Plan
Newport Rd
Lighthouse Rd
98
98
Flint Rock WMA
Plum Orchard
© Mapbox © OpenStreetMap Improve this map

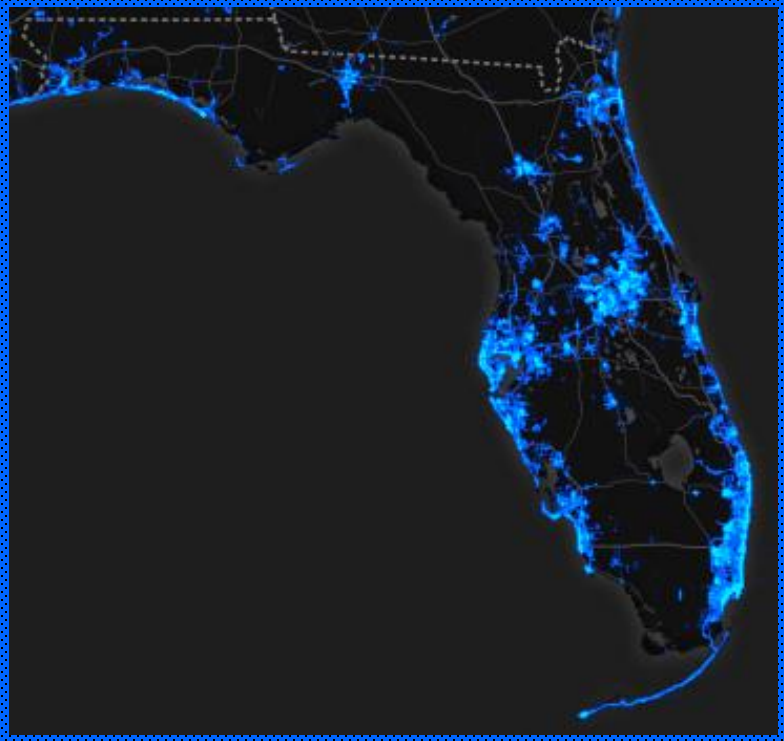
Data Types

Strava Global Heat Map 2015

Bike



Run



http://labs.strava.com/heatmap/#6/-94.60327/31.25977/blue/bike

Data Types

STRAVA | METRO

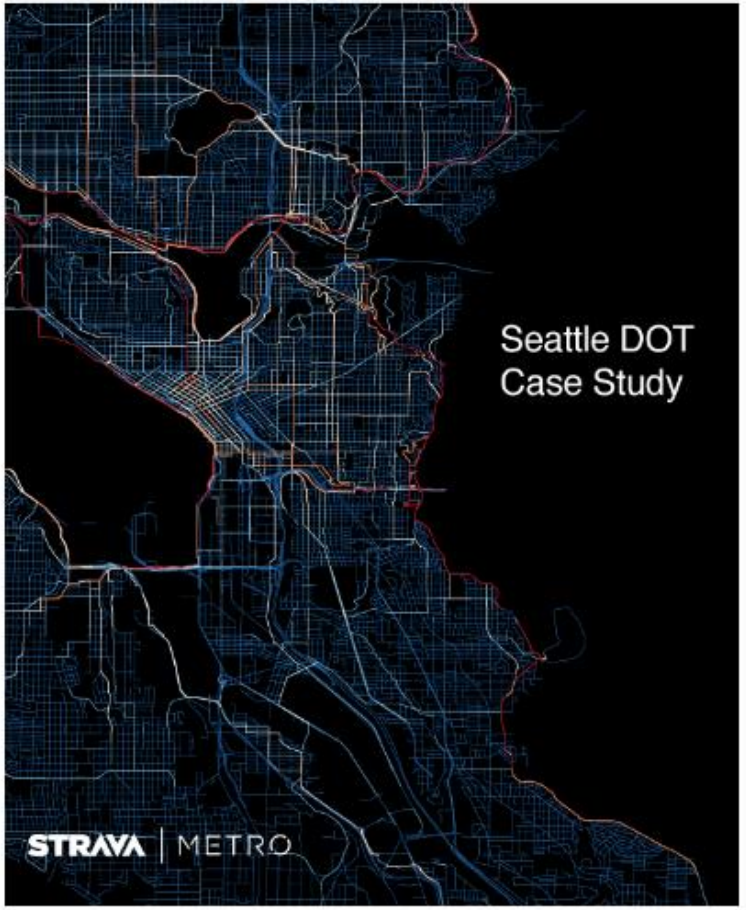
Success Stories

Over 70 cities and organizations around the world are using Strava Metro to improve their bicycle and pedestrian infrastructure. Here are a few inspiring examples of groups partnering with Metro to answer a specific question or make a direct impact on transportation in their area.

SEATTLE QUEENSLAND

Seattle Department of Transportation

In 2015, Seattle added Strava Metro data to its portfolio of traditional bicyclist and traffic data (surveys and bike counts). By combining these data sources, the city has been able to gain new insights on preferred bicyclist routes and characteristics of dangerous intersections.

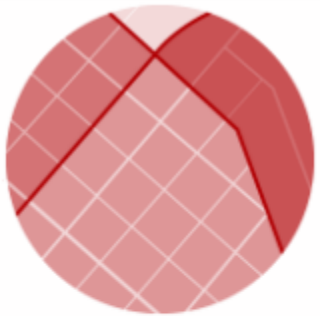


Data Types

Strava Data Sets

Streets

Minute-by-minute activity counts a
your entire network



Origin / Destination

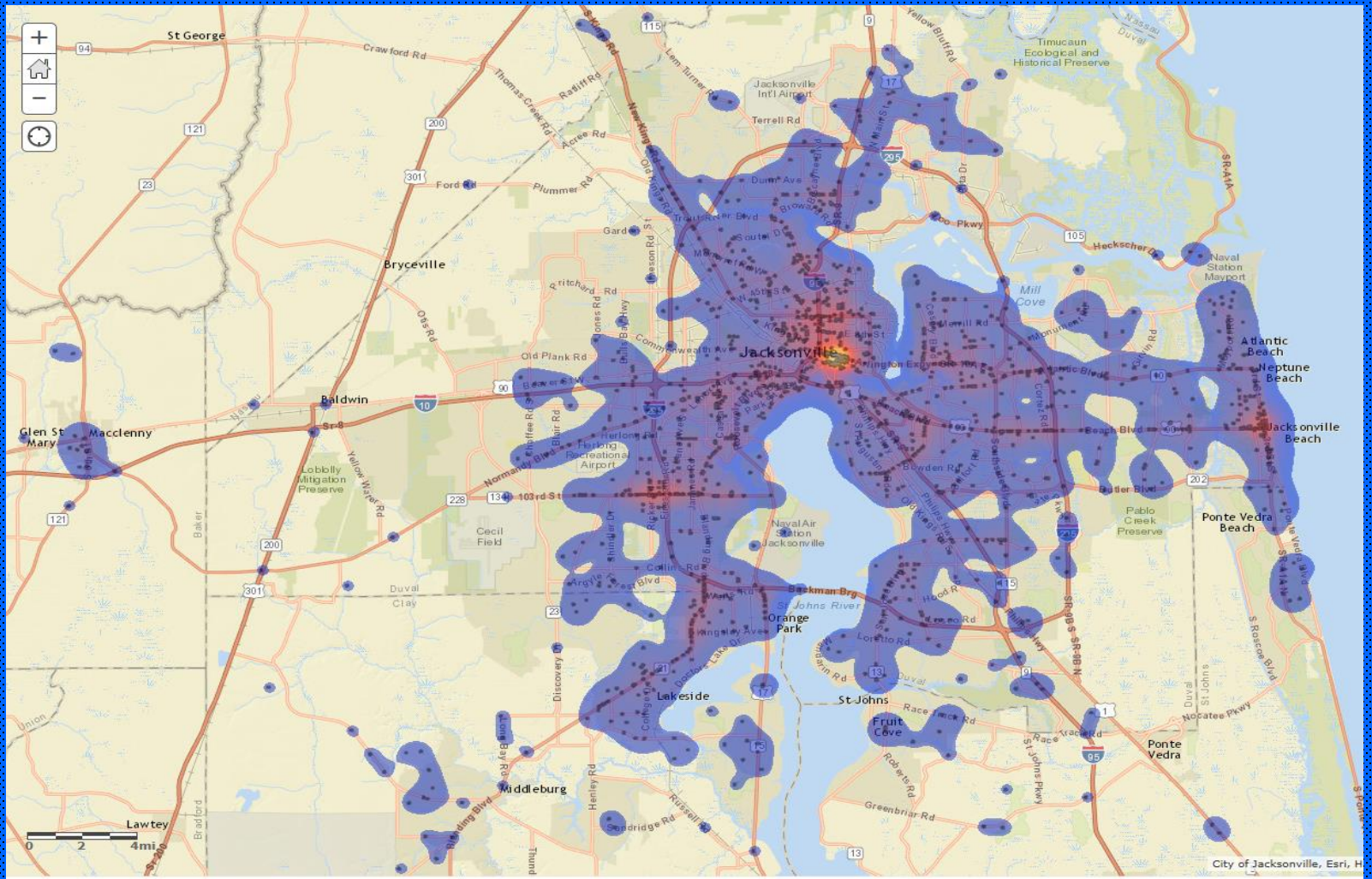
Understand activity starting and ending points, by region

Intersections

Activity counts and wait times at every intersection

Data Types

What is “other pertinent data” and how is it relevant to Vulnerable Road Users?



Duval County Pedestrian Crash Clusters 2009-2015

Data Sources

Federal Data Sources

- Fatality Analysis Reporting System (FARS)
- National Household Travel Survey
- National Survey of Pedestrian and Bicyclist Attitudes and Behaviors (NHTSA)
- Not-in-Traffic Surveillance (NHTSA)
- Census/Demographic Data

State Data Sources

- Crash Reports/GIS Maps
- Hospital/Emergency Department Data
- Vital Statistics
- Economic Impact Data
- Vehicle Miles Traveled/Driver Demographics

Local Data Sources

- Citation Reports
- Public Opinion or Observational Surveys
- Zoning Data
- Transit Data

Data Challenges

Impediments to Data Collection

- ☐ Data Ownership
- ☐ Inability to link files
- ☐ Not Enough Data
- ☐ Too Much Data
- ☐ Challenges Collecting and Compiling Exposure Data

Impediments to Data Analysis

- ☐ Crash Report Contains Inaccurate or Insufficient Data
- ☐ Data Quality
- ☐ Lack of Demographic Data
- ☐ Lack of Uniform Crash Reporting Criteria
- ☐ Inconsistent Data Definitions

Data Analysis

Data analysis is the process of reviewing raw data to find the trends that indicate a problem.

Quantitative research is explaining phenomena by collecting numerical data that are analyzed using mathematically based methods (in particular statistics).

Qualitative research seeks to answer questions about why and how people behave in the way that they do. It provides in-depth information about human behaviors resulting in traffic crashes.

References

Fatality Analysis Reporting Systems (FARS)
The FARS database provides data on highway fatalities resulting from all motor vehicle traffic crashes in the United States every year. All FARS data on fatal motor vehicle traffic crashes is gathered from the State's own source documents and is coded on standard FARS forms.

http://www-fars.nhtsa.dot.gov/Main/index.aspx

State Traffic Safety Information (STSI)
The State Highway Traffic Information website combines FARS data with geographic information system (GIS) data and Google Earth technology.

http://www-nrd.nhtsa.dot.gov/departments/nrd-30/ncsa/STSI/USA%20WEB%20REPORT.HTM

National Household Travel Survey (NHTS)
The National Household Travel Survey (NHTS) is the source of national data on the travel behavior of the American public. The dataset allows analysis of daily travel by all modes and includes characteristics of the people traveling, their household, and their vehicles. For example, between 1969 and 2001, that data showed a dramatic decline in the percentage of students who walked or biked to school.

http://nhts.ornl.gov/

National Survey of Pedestrian and Bicyclist Attitudes and Behaviors
The National Survey of Pedestrian and Bicyclist Attitudes and Behaviors provides a detailed analysis of behaviors and attitudes on various topics related to walking and bicycling, including reported frequency of walking and bicycling during the summer months, trip purpose and characteristics, perceptions of safety, safety practices, facilities available, and community design. In 2012, the survey showed that one-third of those surveyed would like to see improvements in the way their local community is designed for walking.

http://www.nhtsa.gov/nti/811841

References

Not-in-Traffic Surveillance (NiTS)

The Not-in-Traffic Surveillance (NiTS) Study was published by NHTSA in January 2011. It provides counts and details regarding fatalities and injuries that occur in non-traffic crashes and in non-crash incidents. For example, the most common types of non-crash injuries seen in emergency departments were injuries sustained while entering or exiting a vehicle, injuries from closing doors, and injuries from overexertion, such as unloading cargo or pushing a disabled vehicle.

http://www-nrd.nhtsa.dot.gov/Pubs/NCCF08.pdf

Exposure data can provide data needed for a realistic analysis. Sometimes there may not be enough crash data available; however, you need to have enough data to produce a realistic analysis of the problem. You should do a minimum of a 5-year data trend to overcome challenges with pedestrian and bicycle data, localities, States and national data.

National Automotive Sampling System–General Estimate System (NASS-GES) is published annually.

Web-Based Injury Statistics Query and Reporting System (WISQARS) is an interactive database system that provides customized reports on injury-related data. It was created by the National Center for Injury Prevention and Control. Program managers can look at unintentional motor vehicle fatalities and injuries to pedestrian and bicyclists.

There are several national surveys conducted by NHTSA that provide useful data on attitudes and behaviors. Subjects of the surveys include drinking and driving, distracted and drowsy driving, and speeding and unsafe driving. These types of behaviors are not only a risk to other motorists but also to the safety of pedestrians and bicyclists.

Youth Risk Behavior Surveillance Survey (YRBSS) is a biennial school-based, health behavior survey that includes questions on seat belt use, bicycle helmet use, and riding with a driver who had been drinking.

http://www.cdc.gov/healthyyouth/yrbs/pdf/questionnaire/2015_xxh_questionnaire.pdf

References

Florida Traffic Safety Portal:

https://fdotewp1.dot.state.fl.us/TrafficSafetyWebPortal/

Roadway Characteristics Inventory

http://www.fdot.gov/planning/statistics/rci/RCIFC_Handbook.pdf

Strava

https://www.strava.com

Strava Global Heat Maps

http://labs.strava.com/heatmap/#6/-94.60327/31.25977/blue/bike

Strava Metro

http://metro.strava.com

Questions

Next FDOT Webinars

The tentative schedule as of 7/1/2016 is:

- Thursday, November 17th, 2016 - Commercial Vehicle Enforcement
- Thursday, December 15th, 2016 - Legal and Insurance Perspective on Crash Data
- Thursday, January 26th, 2017 - The Importance of Crash Data and Statistics
- Thursday, February 23rd, 2017 - Crash Typing

(dates and topics subject to change)

Please contact Benjamin Jacobs at Benjamin.Jacobs@dot.state.fl.us with any questions or comments.

Next FDOT Webinars

Register now!
https://attendee.gotowebinar.com/register/8578031654679345411

The webinars generally occur on the last Thursday of the month from 2:30 pm to 3:30 pm ET.

For more information, including links to past webinars, please visit our website at: http://www.dot.state.fl.us/safety/11A-SafetyEngineering/crash%20data%20academy/academy.shtm

Further questions?

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